<u>Section I (Amendments to the Claims)</u>

Please amend claims 1, 35, and 46 as set out in the following listing of the claims of the application.

1. **(Currently amended)** A gas sensor assembly comprising a gas-sensing filament comprising nickel or nickel alloy, adapted for detecting a change in at least one property of said gas-sensing filament upon contact with a target gas species and responsively generating an output signal <u>correlative of the change in at least one property and </u>indicative of presence of said target gas species.

2. **(Previously presented)** The gas sensor assembly of claim 1, wherein the target gas species comprises a fluoro species.

3. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by an average diameter of less than about 500 microns.

4. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by an average diameter of less than about 150 microns.

5. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by an average diameter of less than about 50 microns.

6. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by an average diameter in a range of from about 0.1 micron to about 30 microns.

7. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by a length of more than about 1 cm.

8. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by a length of more than about 5 cm.

9. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament is characterized by a length of more than 10 cm.

10. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament comprises a coating structure encapsulating a core structure, wherein said coating structure comprises nickel or nickel alloy, and wherein said core structure has an electrical resistivity that is higher than that of the coating structure and a heat capacity that is lower than that of the coating structure.

11. **(Original)** The gas sensor assembly of claim 10, wherein the electrical resistivity of the core structure is at least about fifty times higher than that of the coating structure, and wherein the heat capacity of said core structure is less than three fourth of that of the coating structure.

12. **(Original)** The gas sensor assembly of claim 10, wherein the electrical resistivity of the core structure is at least about a thousand times higher than that of the coating structure, and wherein the heat capacity of said core structure is less than one half of that of the coating structure.

13. **(Original)** The gas sensor assembly of claim 10, wherein the electrical resistivity of the core structure is at least about 10 $m\Omega \cdot cm$, and wherein the heat capacity of said core structure is less than 2.5 $J/K \cdot cm^3$.

14. **(Original)** The gas sensor assembly of claim 10, wherein said core structure comprises a nickel-copper alloy, and wherein said coating structure consists essentially of nickel.

15. **(Original)** The gas sensor assembly of claim 10, wherein said core structure comprises silicon carbide.

16. **(Original)** The gas sensor assembly of claim 10, wherein said core structure comprises a composite fiber having multiple layers of different materials.

17. **(Original)** The gas sensor assembly of claim 10, wherein said core structure comprises a composite fiber having a carbon core fiber coated with a silicon carbide layer.

18. **(Original)** The gas sensor assembly of claim 1, wherein the gas-sensing filament is electrochemically thinned after fabrication of said gas sensor assembly and is characterized by an average diameter of not more than 50 microns.

19. **(Original)** The gas sensor assembly of claim 18, wherein the gas-sensing filament is characterized by an average diameter of not more than 25 microns.

20. **(Original)** The gas sensor assembly of claim 18, wherein the gas-sensing filament is characterized by an average diameter of not more than 10 microns.

21. **(Original)** The gas sensor assembly of claim 18, wherein the gas-sensing filament is characterized by an average diameter in a range of from about 0.1 micron to about 5 microns.

22. **(Original)** The gas sensor assembly of claim 1, wherein the gas-sensing filament comprises a nickel-copper alloy containing from about 10% to about 90% nickel and from about 10% to about 90% copper by total weight of said alloy.

23 **(Original)** The gas sensor assembly of claim 22, wherein said nickel-copper alloy further comprises from about 10% to about 90% aluminum by total weight of said alloy.

24. **(Original)** The gas sensor assembly of claim 23, wherein said nickel-copper alloy further comprises one or more metals selected from the group consisting of Ti, V, Cr, Mn, Nb, Mo, Ru, Pd, Ag, Ir, and Pt.

25. **(Original)** The gas sensor assembly of claim 1, wherein said gas-sensing filament comprises a porous coating of nickel or nickel alloy.

26. **(Original)** The gas sensor assembly of claim 25, wherein said porous coating is characterized by open pore structures.

27. **(Original)** The gas sensor assembly of claim 1, further comprising a support structure for suspending said gas-sensing filament.

28. **(Original)** The gas sensor assembly of claim 27, wherein said support structure comprises a material that is resistant to said target gas species.

29. **(Original)** The gas sensor assembly of claim 27, wherein the target gas species comprises a fluoro species selected from the group consisting of NF_3, SiF_4, C_2F_6, HF, F_2, COF_2, ClF_3, IF_3, and activated species thereof, and wherein the support structure comprises a material selected from the group consisting of polyimide, aluminum, or nickel.

30. **(Original)** A method for monitoring a fluid locus for the presence of a target gas species therein, said method comprising:

exposing fluid at said fluid locus to a gas-sensing assembly as in claim 1;

monitoring at least one property of the gas-sensing filament of such gas-sensing assembly; and

responsively generating an output signal when the gas-sensing filament exhibits a change in the at least one property thereof, indicating the presence of the target gas species in the fluid locus, or a change in concentration of the target gas species in the fluid locus.

31. **(Original)** The method of claim 30, wherein said at least one property of the gas-sensing filament being monitored is the electrical resistance thereof.

32. **(Original)** A gas sensor assembly comprising a gas-sensing filament comprising a coating structure encapsulating a core structure, wherein said coating structure comprises a gas-sensitive material that exhibit a detectable change upon contact with a target gas species, and wherein said core structure is characterized by an electrical resistivity that is higher than that of the coating structure and a heat capacity that is lower than that of the coating structure.

33. **(Cancelled).**

34. **(Cancelled).**

35. **(Currently amended)** A gas sensor assembly comprising an electrochemically-thinned gas-sensing filament comprising nickel or nickel alloy, wherein said filament is characterized by an average

diameter of not more than 50 microns, wherein at least one property of the gas-sensing filament experiences detectable change in exposure to presence or change in concentration of the target gas species, and the gas sensor assembly is adapted to generate an output signal correlative of the change of the at least one property of the gas-sensing filament.

36. **(Previously presented)** A method for forming the gas sensor assembly of claim 35, comprising the steps of:

(a) providing a gas sensor assembly precursor comprising a gas-sensing filament comprising nickel or nickel alloy, wherein said filament has an average diameter of more than 50 microns;

(b) electrochemically thinning said gas-sensing filament for a sufficient period of time, so as to reduce the average diameter thereof to not more than 50 microns.

37. **(Previously presented)** A method for forming a gas sensor assembly, comprising the steps of:

(a) providing a gas sensor assembly precursor comprising a gas-sensing filament comprising nickel or nickel alloy;

(b) electrochemically thinning said gas-sensing filament for a sufficient period of time, so as to reduce the average diameter thereof.

38. **(Previously presented)** A gas sensor assembly comprising a gas-sensing filament comprising a nickel-copper alloy, wherein said nickel-copper alloy comprises from about 10% to about 90% of nickel, and from about 10% to about 90% of copper.

39. **(Cancelled).**

40. **(Previously presented)** A gas sensor assembly comprising a gas-sensing filament comprising a nickel-copper-aluminum alloy wherein said nickel-copper-aluminum alloy comprises from about 10% to about 90% of nickel, from about 10% to about 90% of copper, and from about 10% to about 90% of aluminum, by total weight of said alloy.

41-45. **Cancelled).**

46. **(Currently amended)** A gas sensor assembly arranged in sensing relationship to a process chamber that is susceptible to presence of one or more target fluoro species, wherein said gas sensor assembly comprises a gas-sensing filament containing nickel or nickel-alloy, as mounted on a fluoro-resistant support structure and coupled to ~~means for detecting~~ at least one element arranged to detect a change in at least one property of said gas-sensing filament upon contact with the target fluoro species and responsively ~~generating~~ generate an output signal indicative of the presence of said target fluoro species.

47. **(Previously presented)** The gas sensor assembly of claim 1, wherein the fluoro species comprises any of NF_3, SiF_4, C_2F_6, HF, F_2, COF_2, ClF_3, IF_3, and activated species thereof.